

AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently Amended) A method for current measurement through a conductor at a potential which is at a higher value than zero potential, comprising:
measuring the voltage drop across a shunt resistance to determine the current value in the form of an analog signal, the shunt resistance being formed by a section of the conductor in which the electrical resistance is increased locally by reducing the cross-section of the conductor;
converting the analog signal to a digital signal using an analog/digital converter;
supplying a reference voltage to the analog/digital converter to compensate for a temperature dependence of the shunt resistance, a temperature course of the analog/digital converter at least approximately corresponding to a temperature course of the shunt resistance;
and
transmitting the ~~measured information, after A/D conversion, in the form of a digital~~ signal to an evaluation unit which is at ground potential;
wherein the analog signal is subjected to compression ~~before A/D conversion and transmission~~based on a non-linear characteristic of the analog/digital converter, and the digital signal is subjected to expansion after transmission at ground potential.
2. (Previously Presented) The method as claimed in claim 1, wherein compression and expansion are effected logarithmically.
3. (Previously Presented) The method as claimed in claim 1, wherein compression and expansion are effected on the basis of the stipulation of root functions.
- 4.-5. (Cancelled).
6. (Previously Presented) The method as claimed in claim 1, in which, in order to evaluate a measurement signal which, at a higher potential than zero potential, is in the form of an analog value in a measuring device that requires a supply current, having the following measures:

- the compressed information content of the measurement signal is transmitted, after A/D conversion, in the form of a digital signal to the evaluation unit, which is at ground potential, and
- after A/D conversion of the measurement signal, the digital signal produced provides the clock for modulating the supply current, with the result that the modulated supply current for the measuring device likewise performs the function of the carrier for the information content of the measurement signal.

7. (Withdrawn) A circuit arrangement for carrying out the method as claimed in claim 1 for use when measuring the current at a shunt, in which the voltage drop is evaluated as a measure of the current after amplification, said circuit arrangement comprising a shunt, an amplifier for the voltage signal that is tapped off at the shunt, an analog/digital converter, an evaluation unit, means for supplying the measuring components with current, and further means for signal compression and signal expansion.

8. (Withdrawn) The circuit arrangement as claimed in claim 7, further comprising means for temperature compensation.

9. (Withdrawn) The circuit arrangement as claimed in claim 7, wherein a unit for signal compression is connected upstream of the A/D converter.

10. (Withdrawn) The circuit arrangement as claimed in claim 7, wherein the means for signal expansion are integrated in the evaluation unit.

11. (Withdrawn) The circuit arrangement as claimed in claim 8, wherein the means for temperature compensation includes a temperature-dependent reference voltage source.

12. (Withdrawn) The circuit arrangement as claimed in claim 7, further comprising means for at least one of short-circuit disconnection and overload disconnection.

13. (Withdrawn) The circuit arrangement as claimed in claim 12, further comprising a first comparator, which compares the instantaneous value of the current with a first threshold value and produces a signal for short-circuit disconnection when said first threshold value is exceeded.

14. (Withdrawn) The circuit arrangement as claimed in claim 12, further comprising a second comparator, which compares the instantaneous temperature of the load with a second threshold value and outputs a signal for overload disconnection when said second threshold value is exceeded.

15. (Withdrawn) The circuit arrangement as claimed in claim 14, further comprising a thermal model of the load, said model being used to ascertain the instantaneous temperature of the load from the current measured.

16. (Cancelled).

17. (Withdrawn) The circuit arrangement as claimed in claim 7, wherein the means for signal expansion are integrated in the evaluation unit in the existing microcontroller, in the form of software.

18.-20. (Canceled)

21. (New) A method for current measurement through a conductor at a potential which is at a higher value than zero potential, comprising:

measuring the voltage drop across a shunt resistance to determine the current value in the form of an analog signal, the shunt resistance being formed by a section of the conductor in which the electrical resistance is increased locally by reducing the cross-section of the conductor;
converting the analog signal to a digital signal using an analog/digital converter; and
transmitting the digital signal to an evaluation unit which is at ground potential;

wherein the analog signal is subjected to compression based on a non-linear characteristic of the analog/digital converter, and the digital signal is subjected to expansion after transmission at ground potential.